FIRST: ALGEBRA

Choose the correct answer:

(1) If the mode of the values 7,5,x+4,5,7 is 5, then x = ...

a 1 b 4 c 5 d 7

(2) The arithmetic mean of the values 1,6,4,8,6 is .....

a 25 b 5 c 6 d 8

(3) The algebraic term $6x^3y^2$ is of ..... degree

a third b fourth c fifth d sixth

(4) The rational number that lies between $\frac{1}{3}$ and $\frac{5}{9}$ is .....

a $\frac{2}{3}$ b $\frac{3}{4}$ c $\frac{4}{9}$ d $\frac{5}{27}$

(5) The multiplicative inverse of the number $\left(\frac{1}{2}\right)^2$ is .....

a 4 b -4 c 2 d -2

(6) If $\frac{5}{x+2}$ is a rational number, then x ≠ .....

a -2 b 0 c 2 d 5

(7) The median of the values 5,4,7 is .....

a 4 b 5 c 7 d 16

(8) If $\frac{4}{7}x = \frac{4}{7}$, then x = ...

a 1 b 0 c 4 d 7

(9) The arithmetic mean of the values 2,3,8,2,5 is .....

a 3 b 2 c 4 d 8

(10) The additive inverse of -3 is .....

a -3 b 3 c $\frac{1}{3}$ d $\frac{-1}{3}$

(11) The reminder of subtracting 7x from 9x is .....

a 2x b 16x c -2x d 0

(12) The mode of the values 3,3,4,4,5,3 is .....

a 4 b 22 c 5 d 3

(13) If $\frac{3}{x-7}$ is not a rational number, then x = ...

a 0 b 7 c -7 d -3

(14) 7x exceeds -5x by .....

a 12x b 2x c -2x d $-2x^2$

(15) The additive inverse of the number $\frac{3}{7}$ is .....

a $\frac{7}{3}$ b $\frac{-7}{3}$ c $\frac{-3}{7}$ d 7

(16) $\frac{-2}{5} \times 1 = \frac{-2}{5}$ (..... property)

a commutative c associative

b multiplicative identity d additive identity

(17) The additive inverse of the number $\left(\frac{-1}{5}\right)^0$ is .....

a 1 b -1 c 5 d -5

(18) $a + a =$ .....

a $2a^2$ b $2a$ c a^2 d 1

(19) The degree of the algebraic expression $5x^3 + 7x + 4$ is .....

a first b second c third d fourth

(20) The number $\frac{5}{12}$ = ...

a 0.42 b 0.416 c $0.41\dot{6}$ d $0.4\dot{5}$

(21) If $\left(\frac{-4}{3}\right) + a = 0$, then a = ...

a $\frac{3}{4}$ b $\frac{4}{3}$ c 1 d 0

(22) The H.C.F. of $12x^3 + 6x^2$ is .....

a 6 b $6x^2$ c x^2 d $3x^2$

Complete:

(1)	$2\frac{1}{5} \times$ ..... $= 1$	"$\frac{5}{11}$"
(2)	$0.18 - 30\% =$	"-0.12"
(3)	$7x^3y^2 \times$ ..... $= 21x^3y^5$	"$3y^3$"
(4)	$(2x-3)(x+5) = 2x^2 +$ ..... $- 15$	"7x"
(5)	$24x^4y^6 = 6x^2y^3 \times$	"$4x^2y^3$"
(6)	The reminder of subtracting -3x from 2x is	"5x"
(7)	1, 1, 2, 3, 5, 8, ... (in the same pattern)	"13"
(8)	If the mode of the values 7, 5, a+3, 5, 7 is 7, then a = ...	"4"

(9)	$5x^2 + 15 \times y = 5 \times (\ldots\ldots + \ldots\ldots)$	"x + 3y"
(10)	The algebraic term 5 x y is of the …… degree.	"second"
(11)	$(x-3)(\ldots\ldots + \ldots\ldots) = x^2 - 9$	"x + 3"
(12)	The rational number which hasn't a multiplicative inverse is ……	"0"
(13)	The median of the values 3, 5, 4 is ……	"4"
(14)	If $\frac{x-7}{5} = 0$, then x = ……	"7"
(15)	$3x^2 + 15y = \ldots\ldots (x^2 + 5y)$	"3"
(16)	(3x+5) + (4x-5) = ……	"7x"
(17)	$\frac{1}{2}$ = …… %	"50"
(18)	If $\frac{a}{b} = \frac{1}{2}$, then $\frac{2a}{b}$ = ……	"1"
(19)	The rational number $\frac{x-4}{x+5} = 0$, then x = ……	"4"
(20)	The multiplicative inverse of the number $3\frac{1}{3}$ is ……	" $\frac{3}{10}$ "
(21)	If $a \times \frac{b}{5} = \frac{a}{5}$, then b = ……	"1"
(22)	$\frac{3x}{5} - \frac{x}{5}$ = ……	" $\frac{2x}{5}$ "
(23)	The remainder of subtracting -3x from 5x is ……	"8x"
(24)	$1\frac{1}{3} + \frac{3}{5}$ = ……	" $\frac{29}{15}$ "
(25)	$7a^3$ - …… = $3a^3$	"$4a^3$"
(26)	The coefficient of the algebraic term $\frac{1}{3}x^4yz$ is ……	" $\frac{1}{3}$ "

(27)	The multiplicative inverse of $\left\|-\frac{1}{9}\right\|$ is	"9"
(28)	$x^2 + 3yx - x^2 + 2xy$ = ...	"5xy"
(29)	The H.C.F. of: $15x^3 + 5x^5$ is	"$5x^3$"

Essay problems:

(1)	Subtract $5x^2 + y^2 - 3xy + 1$ from $6x^2 - 2xy + 3y^2$
(2)	Use the distribution property: $\frac{27}{16} \times \frac{11}{7} + \frac{27}{16} \times \frac{11}{7} - \frac{27}{16} \times \frac{6}{7}$
(3)	Simplify: (2x-3) (2x+3)+7, then calculate the numerical value of the result when x = -1
(4)	Divide: $(2x^3 + 3x^2 - 4x - 6)$ by $(2x + 3)$ where $\left(x \neq \frac{-3}{2}\right)$
(5)	What is the increase of: 7x + 5y + z than 2x + 6y + z ?
(6)	Divide: $(14x^2y - 35xy^2 + 7xy)$ by $(7xy)$ where $x \neq 0$ and $y \neq 0$
(7)	If a = 3 , b = $\frac{2}{3}$ and c = $\left\|-\frac{4}{3}\right\|$, find: $c^2 - a\,b$
(8)	Write four rational numbers between: $\frac{3}{2}$ and $\frac{3}{4}$.
(9)	Add (3a - 7b - 5c) to (-a + c + 4b)
(10)	Use the distribution property: $6 \times \frac{5}{7} + 2 \times \frac{5}{7} - \frac{5}{7}$.
(11)	Find the rational number which lies at the fourth way between $\frac{1}{7}$ and $\frac{3}{7}$ from the side of the smaller number.
(12)	Subtract: (x - 5xy + y) from (2x - xy + 4y)

(13) Simplify: $(x-3)(x+3) + 9$, then find the numerical value of the result when $x = 5$

(14) Factorize by identifying H.C.F.: $4x^2y^3 - 2xy^2 + 6x^3y$

(15) If the arithmetic mean of the numbers: 8, 7, 5, 9, 4, 3, k+4 is 6, then find the value of k.

(16) The following table shows Ahmed's marks in Mathematics exam in 6 months:

Month	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
Mark	30	35	42	37	44	50

Find the arithmetic mean of the marks.

(17) The following frequency distribution shows the marks of 40 pupils in an exam:

Mark	15	16	17	18	19	20
Freq.	4	5	8	12	7	4

Find the mode mark.

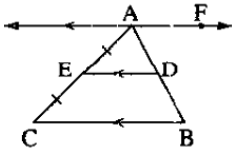
SECOND: GEOMETRY

Choose the correct answer:

(1) If $\angle x \equiv \angle y$, $\angle x$ and $\angle y$ are supplementary angles, then $m(\angle x) =$ ……°

a 45 b 90 c 135 d 180

(2) In the opposite figure:
$\overleftrightarrow{AF}$ // $\overleftrightarrow{DE}$ // $\overleftrightarrow{BC}$ and AE = EC,
then AD : AB = ……



a 2:1 b 3:2 c 1:3 d 1:2

(3) The two straight lines that are perpendicular to a third are ……

a perpendicular c intersecting
b coincident d parallel

(4) The measure of each of the two equal complementary angles equals ……°

a 180 b 45 c 360 d 90

(5) If two straight lines intersect, then each two …… angles have the same measure.

a vertically opposite c adjacent
b alternate d corresponding

(6) If $\angle x$ complements $\angle y$ and $\angle x \equiv \angle y$, then $m(\angle x) =$ ……°

a 45 b 90 c 180 d 360

(7) If $\Delta ABC \equiv \Delta XYZ$ and $m(\angle A) = m(\angle B) = 100°$, then $m(\angle X) =$ ……°

a 50 b 80 c 90 d 100

(8) The sum of the measures of the accumulative angles at a point equals ……°

a 630 b 180 c 90 d 100

(9) The supplement of the angle of measure 30° is an angle of measure ……°

a 60 b 180 c 150 d 90

(10) The angle whose measure is more than 90° and less than 180° is …… angle

a an obtuse b an acute c a right d a straight

(11) If $\Delta ABC \equiv \Delta XYZ$, then AB = ……

a XY b XZ c YZ d BC

(12) The sum of the measures of the accumulative angles at a point equals …… right angles

a 6 b 5 c 3 d 4

(13) If $\Delta ABC \equiv \Delta XYZ$, $m(\angle A)=40°$ and $m(\angle Z)=80°$, then $m(\angle B)=$……°

a 40 b 80 c 70 d 60

(14) $\angle XYZ$ = $\overrightarrow{YZ}$ …… $\overrightarrow{YX}$

a ∪ b ∩ c ≡ d =

(15) The complement of the zero angle …… angle.

a an obtuse b an acute c a right d zero

(16) If $m(\angle A) + m(\angle B) = 180°$, then $\angle A$ and $\angle B$ are ……

a equal in measure c complementary angles

b supplementary angles d adjacent angles

(17) If the vertically opposite angles are complementary, then the measure of each one equal ……°

a 45 b 50 c 90 d 180

(18) If a line segment is extended from one of its terminals without limit, it will be .....

a a line segment c a ray

b a straight line d an angle

(19) If $m(\angle A) = 170°$, then $m(reflex\angle A)$ = ...°

a 190 b 180 c 170 d 360

(20) The angle whose measure is $90\frac{1}{2}^{\circ}$ is .....

a an obtuse b an acute c a right d a straight

(21) If two straight lines are perpendicular to a third, then the two straight lines are .....

a perpendicular c parallel

b congruent d intersecting

Complete:

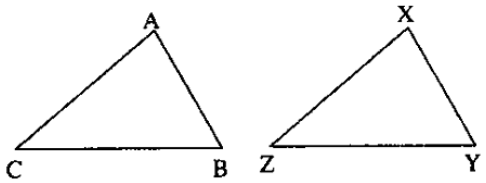
(1) The perpendicular bisector of a line segment is called .....

(2) In the opposite figure:

If $\Delta ABC \equiv \Delta XYZ$,

$m(\angle A) + m(\angle B) = 140°$,

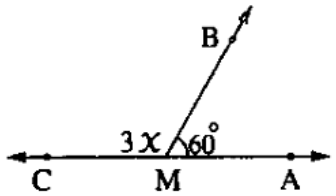
Then $m(\angle Z)$ = ...°

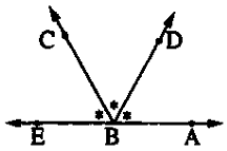


(3) In the opposite figure:

If $\overrightarrow{MB} \cap \overrightarrow{AC} = \{M\}$, $m(\angle AMB) = 60°$

then the value of x equals .....°



(4)	The sum of measures of the accumulative angles at a point equals ……°
(5)	If a straight intersects two parallel straight lines, then each two corresponding angles are ……
(6)	The two adjacent angles formed by the intersection of a straight line and a ray are ……
(7)	The angle whose measure is 50° complements an angle of measure ……°
(8)	The two straight lines parallel to a third are ……
(9)	If $\Delta ABC \equiv \Delta XYZ$, then $m(\angle Z) = m(\angle .....)$
(10)	In the opposite: If $B \in \overleftrightarrow{AE}$, then $m(\angle ABD) =$ ……° 
(11)	If two straight lines intersect, then each two vertically opposite angles are ……
(12)	The two angles are congruent if they are ……
(13)	The complement of the acute angle is …… angle.
(14)	If two adjacent angles are supplementary, then their outer sides are ……
(15)	The two triangles are congruent if two sides and …… …… of one triangle are congruent to the corresponding parts of the other triangle.
(16)	The two adjacent angles formed by a straight line and a ray with a starting point on this straight line are ……
(17)	…… is the union of two rays with the same starting point.
(18)	If $\overline{AB} \equiv \overline{CD}$, then AB – CD = ……

(19) If Z is the midpoint of $\overline{XY}$, then $\overline{XZ}$ ..... $\overline{YZ}$

(20) If the two outer sides of two adjacent angles are on the same straight line, then these two angles are .....

(21) The supplement of the obtuse angle is ..... angle.

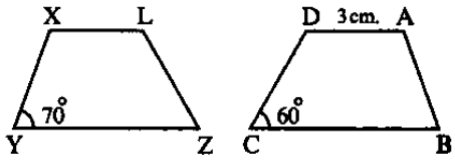
(22) In the opposite figure:

If ABCD ≡ XYZL, complete

(1) LX = ... cm

(2) $m(\angle B)$ = ...°

(3) $m(\angle Z)$ = ...°



Essay problems:

(1) Mention two cases of congruency of two triangles.

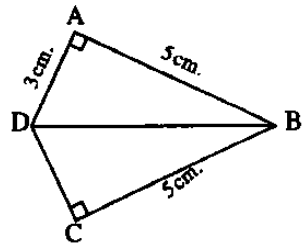
(2) **In the opposite figure :**

m (∠ BAD) = m (∠ BCD) = 90°

, AB = CB = 5 cm. , AD = 3 cm.

Mention the conditions for Δ ABD , Δ CBD to be congruent

, then find : The length of $\overline{CD}$



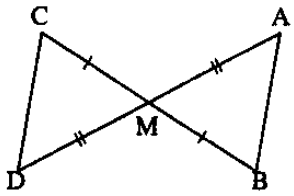
(3) **In the opposite figure :**

$\overline{AD} \cap \overline{BC} = \{M\}$

, BM = MC

, AM = MD

Write the conditions for Δ AMB , Δ DMC to be congruent.



(4) **In the opposite figure :**

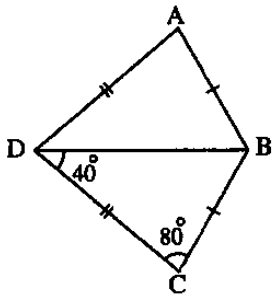
$AB = BC$, $AD = DC$

, $m(\angle C) = 80°$

, $m(\angle BDC) = 40°$

Prove that : $\Delta CBD \equiv \Delta ABD$

, then find : $m(\angle ABD)$

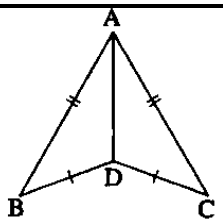


(5) **In the opposite figure :**

$AB = AC$ and

$BD = CD$

Show that : $\overrightarrow{AD}$ bisects $\angle BAC$



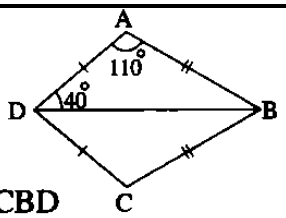
(6) **In the opposite figure :**

$BA = BC$, $DA = DC$, $m(\angle A) = 110°$

and $m(\angle ADB) = 40°$

(1) Mention the reason of congruency of the two triangles ABD and CBD

(2) **Find :** $m(\angle ABC)$

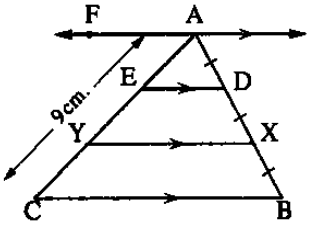


(7) **In the opposite figure :**

$\overleftrightarrow{AF} // \overline{DE} // \overline{XY} // \overline{BC}$

, $AD = DX = XB$, $AC = 9$ cm.

Find : The length of $\overline{AY}$ (Give the reason)



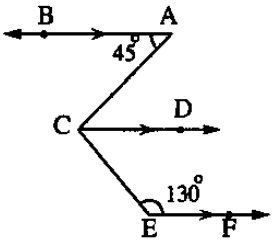
(8) **In the opposite figure :**

$\overrightarrow{AB} // \overrightarrow{CD} // \overrightarrow{EF}$

, $m(\angle A) = 45°$

, $m(\angle E) = 130°$

Find : $m(\angle ACE)$



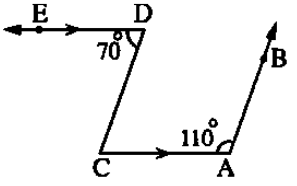
(9) **In the opposite figure :**

$\overrightarrow{DE} // \overline{AC}$, $m(\angle A) = 110°$

, $m(\angle D) = 70°$

Find : $m(\angle C)$

Is $\overrightarrow{AB} // \overline{CD}$? (Give the reason)



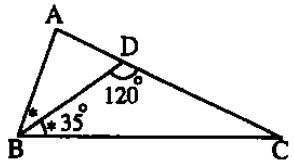
(10) **In the opposite figure :**

$\overrightarrow{BD}$ bisects ∠ ABC

, m (∠ DBC) = 35°

, m (∠ BDC) = 120°

Find : m (∠ A) in degrees.



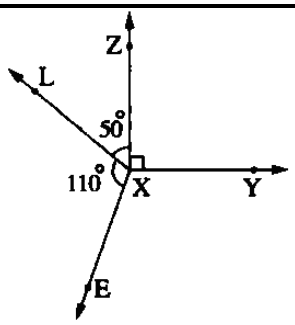
(11) **In the opposite figure :**

m (∠ YXZ) = 90°

, m (∠ ZXL) = 50°

and m (∠ LXE) = 110°

Find with giving the reason : m (∠ YXE)



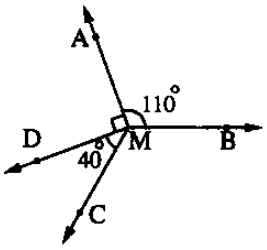
(12) **In the opposite figure :**

m (∠ AMB) = 110°

, m (∠ AMD) = 90°

, m (∠ DMC) = 40°

Find with steps : m (∠ BMC)

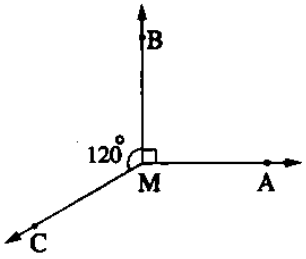


(13) **In the opposite figure :**

m (∠ AMB) = 90° and

m (∠ BMC) = 120°

Find with proof : m (∠ AMC)



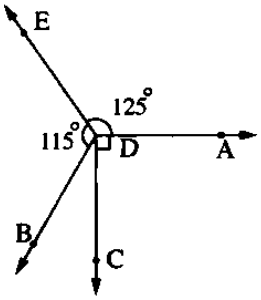
(14) **In the opposite figure :**

Find the measure of the angle CDB where

m (∠ ADE) = 125°

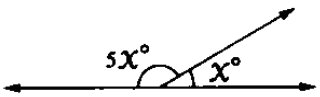
, m (∠ BDE) = 115°

and $\overrightarrow{DA} \perp \overrightarrow{DC}$



(15) **In the opposite figure :**

Find the value of x in degrees.



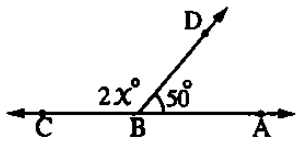
(16) **In the opposite figure :**

$\overleftrightarrow{AC} \cap \overrightarrow{BD} = \{B\}$

, $m(\angle ABD) = 50°$

, $m(\angle DBC) = 2\mathcal{X}°$

Find in degrees the value of $\mathcal{X}$

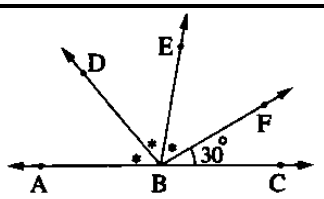


(17) **In the opposite figure :**

$B \in \overleftrightarrow{AC}$, $m(\angle FBC) = 30°$

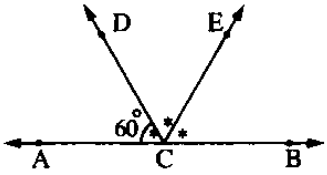
and $m(\angle ABD) = m(\angle DBE) = m(\angle EBF)$

Find : $m(\angle ABE)$



(18) **In the opposite figure :**

Are $\overrightarrow{CA}$ and $\overrightarrow{CB}$ on the same straight line ? Why ?



(19) Using the geometric instruments , draw $\angle ABC$ where $m(\angle B) = 80°$, then draw $\overrightarrow{BD}$ to bisect it. (Don't remove the arcs).

(20) Using the geometric instruments , draw $\angle ABC$ of measure $110°$, then draw $\overrightarrow{BF}$ to bisect the angle.

THIRD: ACCUMULATIVE SKILLS

Choose the correct answer:

(1) Fifth of the number 5^{10} is .....

a 5^2 b 1^{10} c 5^9 d 2.5^{10}

(2) If three times of a number is 15, then the fifth of this number is .....

a 3 b 75 c 1 d 5

(3) 0.0565 ≅ ..... (to the nearest hundredth)

a 0.056 b 0.057 c 0.06 d 0.1

(4) $2\frac{1}{5} \times$ ..... = 1

a $2\frac{1}{5}$ b $\frac{11}{5}$ c $\frac{5}{11}$ d $\frac{5}{2}$

(5) 12 % of 200 kg = ... kg

a 12 b 24 c 2400 d 0.06

(6) $\left|\frac{-5}{3}\right|$ ..... zero

a > b = c < d ≥

(7) The image of the point (-3,5) by translation of 3 units in the negative direction of y-axis is .....

a (-3,2) b (-3,8) c (-6,5) d (0,8)

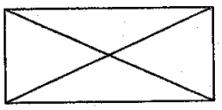
(8) The image of the point (-3,5) by translation of 3 units in the positive direction of y-axis is .....

a (-3,2) b (-3,8) c (-6,5) d (0,5)

(9) The volume of a cuboid whose dimensions 2 cm, 5 cm and 4 cm is ..... cm^3

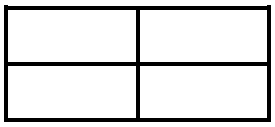
a 28 b 11 c 40 d 18

(10) The number of triangles in the opposite figure is .....



a 2 b 4 c 6 d 8

(11) The number of rectangles in the opposite figure is .....



a 4 b 5 c 7 d 9

(12) A cube of edge length 5 cm, then its volume = ... cm^3

a 5 b 25 c 10 d 125

(13) The two diagonals are perpendicular and equal in length in the .....

a rectangle b rhombus c square d trapezium

(14) If the area of a square is 25 cm^2, then its perimeter = ... cm

a 5 b 10 c 15 d 20

(15) The square has ..... axes of symmetry.

a 1 b 2 c 3 d 4

(16) The cubic centimeter is the measuring unit for .....

a perimeter b area c volume d length

(17) The number of edges of a cuboid is .....

a 6 b 8 c 10 d 12

Best Wishes